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U. S. DEPARTMENT OF AGRICULTURE

# IMPROVED PROCESS FOR CHEDDAR CHEESE INSURES UNIFORMLY GOOD PRODUCT

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A method of making American Cheddar cheese, developed by the Bureau of Dairy Industry of the U. S. Department of Agriculture, greatly simplifies the whole factory operation and enables the average cheesemaker to produce a uniform and high-quality product regularly. For centuries successful cheesemaking depended on the cheesemaker's experience and skill. Because of the variation in the operator's ability and also in the quality of the milk received at the different cheese factories, much of the Cheddar cheese supplied to our retail markets has not been of the best quality, and the composition has not been uniform.

The improved method does away with these variations. It differs from the older methods mainly in that (1) the milk is pasteurized, thus destroying bacteria responsible for most of the defects in Cheddar cheese; (2) an active and dependable starter, containing only the essential bacteria, is added; (3) the cheesemaker follows an exact time schedule, thus controlling the rate and amount of acid developed during the process.

Research in the Bureau of Dairy Industry showed that Cheddar cheese made from good-quality pasteurized milk can be cured at a temperature as high as 60 degrees Fahrenheit, as against 50 degrees or below, which is common practice in making this cheese from unpasteurized milk. At the higher curing temperature the cheese ripens in about half the time that is required at the lower temperatures. By permitting the continued activity of essential bacteria in cheese made by the time schedule from high-grade, pasteurized milk, the higher temperature curing favors the development of true Cheddar flavor.

The Bureau's time-schedule method of making Cheddar cheese from pasteurized milk has been adopted by many cheese manufacturers. In order to improve the quality of Cheddar cheese, Bureau specialists early in the war introduced the method in some 160 factories in 9 States. Because the resulting cheese made in these factories graded higher and was more uniform in quality, the method was adopted by more manufacturers. According to a survey conducted late in the war by the National Cheese Institute, over 40 percent of the plants making American-type cheese were equipped to pasteurize, and more than 50 percent of the cheese manufactured was made from pasteurized milk.

Impetus was added to the pasteurization movement during the war when several outbreaks of disease were traced to raw-milk cheese, or to cheese that had not ripened sufficiently. As a result, regulations have been enacted in 10 States, Canada, and several cities requiring that the cheese either be made from pasteurized milk or ripened for a definite period of time. Similar regulations on a nation-wide basis are now under consideration by the Federal Food and Drug Administration.

The following pictures show the main steps in the process developed by Department dairy specialists.

(OVER)

(EDITORS AND WRITERS: You may obtain 8x10 glossy prints of any of the pictures here shown free on request to Press Service, Office of Information, U. S. Department of Agriculture, Washington 25, D.C.)

The manufacture of Cheddar cheese by the process developed by U. S. Department of Agriculture dairy specialists starts with the pasteurization of the milk. A starter, containing an active mixture of Streptococcus lactis and other desirable bacteria, is added to the pasteurized milk, after which the milk is held for exactly 1 hour at 88 degrees Fahrenheit. Then rennet is added to "set," or curdle, the milk. The milk is held, without stirring, for 30 minutes at the same temperature to allow it to coagulate. The curd is then cut into small cubes and stirred gently for 15 minutes, according to the time schedule. During the next 30 minutes, the cut curd is heated slowly, with gentle stirring, to raise the temperature from 88 to 100 degrees. The curd is held at 100 degrees for 1 hour, with continuous stirring, or stirring every 15 minutes. At the end of the hour, the free whey is allowed to drain off and the curd is packed down in the bottom of the vat to a depth of 7 or 8 inches. When it has matted sufficiently to be turned without breaking, it is cut into slabs 5 to 6 inches wide, which are turned and reversed regularly every 10 to 15 minutes for 2 hours.

Two hours and 15 minutes after the whey first begins to drain, the curd is milled by running it through a curd mill which cuts it into small pieces; 15 minutes later the curd is salted. When the salt has dissolved completely -- after about 30 minutes -- the curd is placed in cloth-lined hoops and pressed for not less than 25 minutes. Then the cheeses are dressed and put under pressure again, remaining there for 24 hours.

The cheeses are removed from the press and kept in the drying room at a temperature of from 50 to 60 degrees Fahrenheit for several days. Then they are dipped in paraffin heated to 220 degrees and placed in the curing room, where the temperature may be as high as 60 degrees and the relative humidity 70 to 75 percent. Curing usually takes at least 3 months at 60 degrees, or 6 months or longer at 50 degrees.

(1) H. R. Lochry, dairy manufacturing technologist, determines the temperature of fresh milk as it flows from the forewarmer to the float tank, preparatory to pasteurization. From the pasteurizer the milk flows to the cheese vat.

(2) He adds the starter while an assistant stirs the pasteurized milk.

(3) He stirs the milk while J. P. Malkames, another dairy manufacturing technologist, adds the rennet.

(4) He cuts the curd into small cubes

(5) And stirs the curd as it is heated.

(6) J. P. Malkames turns the slabs of curd

(7) And, with H. R. Lochry, puts the curd through the curd mill.

(8) Together, they salt the curd, thoroughly mixing in the salt with a cheese fork.

(9) J. P. Malkames places the salted curd into hoops.

(10) C. D. Mitchell, a scientific aide, applies pressure to the cheese-filled hoops.

(11) And, finally, takes a sample of the cheese as it is removed from the press.